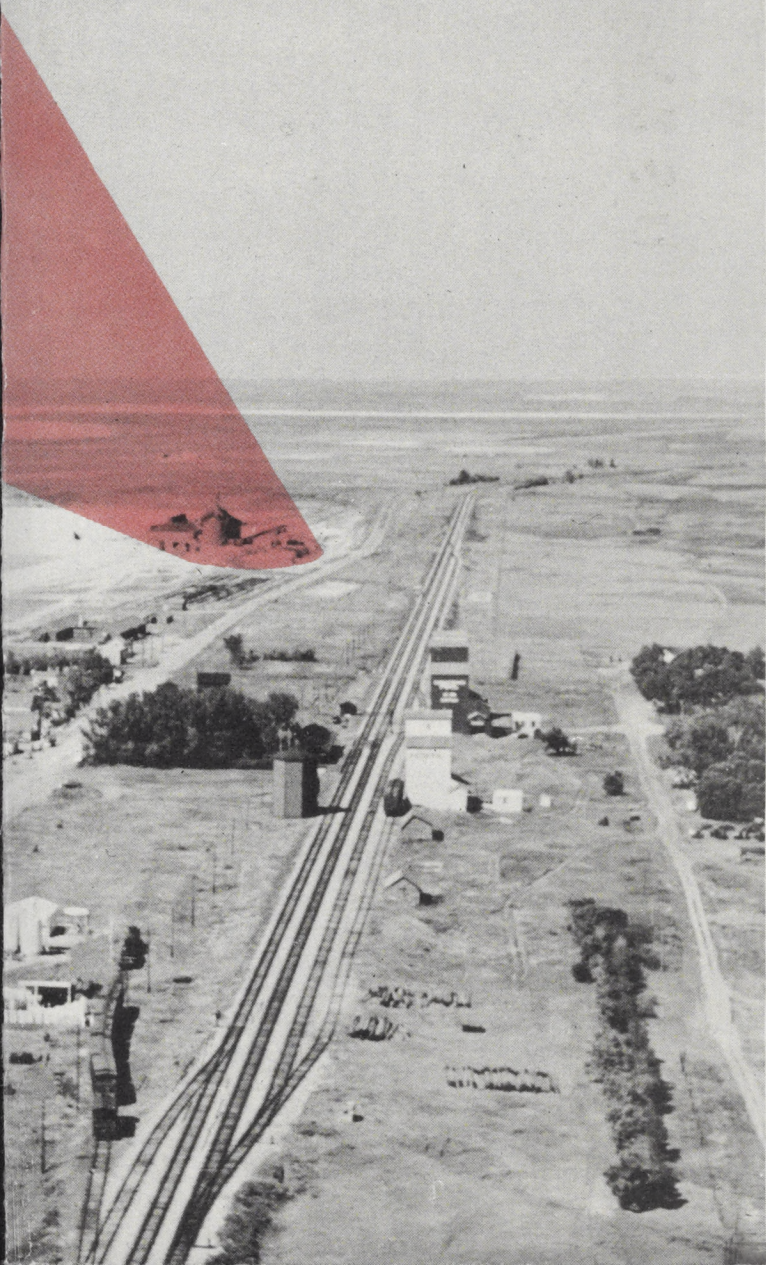


# ALKALI TO SODIUM SULPHATE

10 YEARS OF TRANSFORMATION

CHAPLIN, SASKATCHEWAN

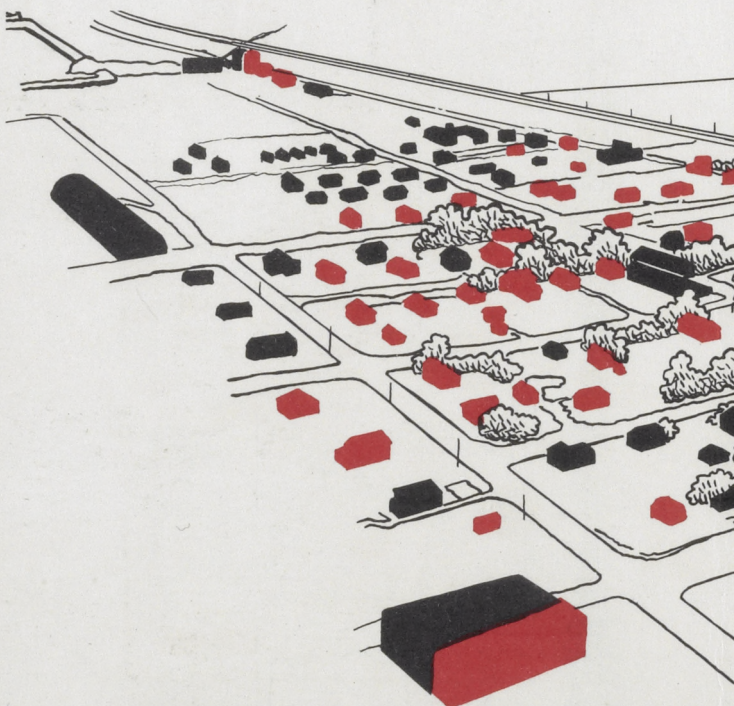




To residents of the district, Lake Chaplin, an alkali slough, was for many years considered nothing more than a source of annoyance. Although it was realized this large shallow lake was a source of sodium sulphate, its true commercial value was not appreciated until investigations by the provincial government in 1944 revealed that it contained vast quantities of this mineral resource in high demand for the production of kraft paper. Here the government saw an opportunity to transform a wasteland into an industry which would provide a valuable source of revenue for the province as a whole.

Saskatchewan is the only province in which sodium sulphate is known to occur in commercial quantities. Tests at Chaplin showed a potential supply of 15 million tons. Construction of a million dollar plant to extract and process the mineral was completed in 1948, and during the first year of operation, from May to December 31, the dollar profit earned was \$57,725. Since 1948, sodium sulphate valued at \$8,464,849.14 has been produced.

Even then one of the world's largest sodium sulphate plants, it was fitted with specially designed evaporators and complete auxiliary equipment. To obtain a product of highest quality, the brine pumping method was selected to recover the raw material. Two reservoirs were constructed to supply anticipated customer requirements.

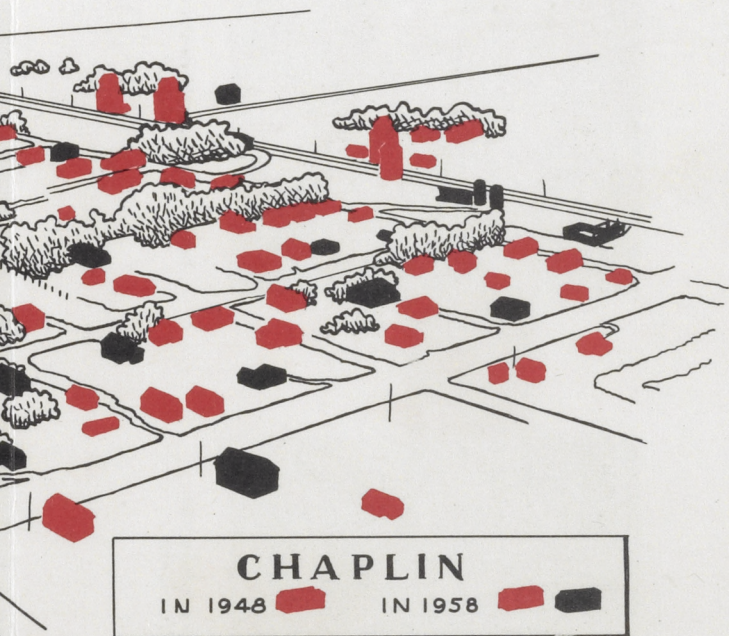


# 1958

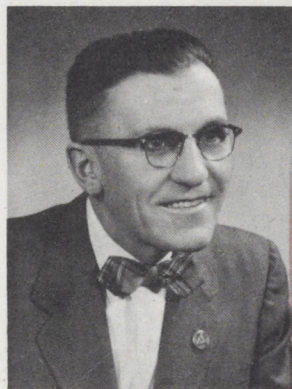
Today—ten years later—the plant is in better operating condition than ever. Stainless steel has replaced the original mild steel in most process equipment and combustion techniques have been markedly improved. The rate of production has doubled.

A further addition to the plant has been the installation of a third reservoir. Better stockpiling methods guarantee a product which is practically free of insoluble material, and improved water control assures an annual supply of brine for harvesting.

Other improvements include new screening methods and auxiliary crushing facilities. The most recent innovation has been the changeover from heavy fuel oil to natural gas which enables the Chaplin plant to produce a uniformly high grade sodium sulphate, equal to the best.







After ten years of successful operation this enterprise can be regarded as a good example of public ownership and development of a resource. Net earned surplus has averaged about \$100,000.00 per year after all expenses and providing for depreciation and other reserves, payment of substantial amounts of interest, payment of local, provincial and federal taxes and payment of royalties to the Provincial Government in excess of \$400,000.00.

Total capital invested by the Province in the plant at the present time is \$1,085,000.00. Over the past ten years a number of technical improvements have been introduced in the plant. The latest was made possible by the use of natural gas. An excellent reputation for the finished product and good sales connections have been established.

Credit for this success must be largely given to Mr. Gordon F. Miller, General Manager, his staff and employees as well as those people who have served on the Board of Directors through these years. Mr. J. L. Phelps, former Minister of Natural Resources, was the Chairman of the first Board of Directors. Subsequent Chairmen were Honourable L. F. McIntosh and Honourable A. G. Kuziak. Only since 1956 have I occupied that position.

At this time I would like to wish for continued success of this valuable enterprise and prosperity and happiness for all the loyal and capable employees of the Division.

J. H. BROCKELBANK,  
Chairman of the Board,  
Saskatchewan Minerals.

# 1948

## ONE PLANT



CHAPLIN

=

ROYALTIES  
\$435,000

PROFITS  
\$1,163,662\*



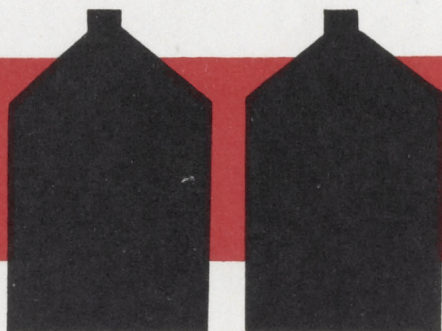
INVESTMENT  
**\$1,085,000**

PAID TO GOVERNMENT\*  
**\$1,598,662**



# 1958

## TWO PLANTS



CHAPLIN

BISHOPRIC

NT\*  
\*1958 Profit Estimated at \$250,000

# CHAPLIN

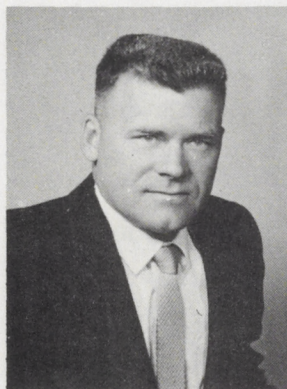
The Village of Chaplin provides a vivid illustration of the benefits derived from the presence of a thriving industry. This small prairie centre has grown steadily from a population of 150 persons in 1947 to nearly 500 in 1958.

Some comparisons are noteworthy:

Between census years 1946 and 1956, Chaplin's population increased 210 per cent. In contrast, the largest gain among seven neighbouring villages of comparable size was 37 per cent; the average gain in all seven was 14 per cent.

In 1948 Chaplin's school had a teaching staff of three and an enrolment of 80. Today the enrolment has tripled and five new teachers have been added to the staff.

Chaplin is proud of the new buildings which bear witness to growth and prosperity, particularly the new skating rink. The healthy economic status of the village, now almost a town, is due in large measure to the \$2 million paid out in wages to employees of the plant since 1948.



We have a great sense of pride in the rapid developments that have taken place in the production of sodium sulphate at our Chaplin plant.

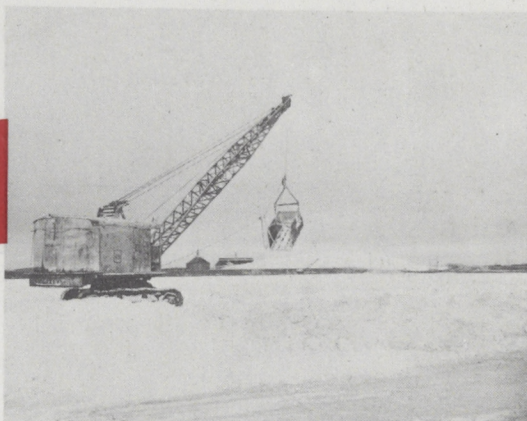
On behalf of the Corporation, employees and the Board of Directors, I would like to extend an open invitation to one and all to visit and inspect our plant and premises at any time.

G. F. MILLER  
General Manager

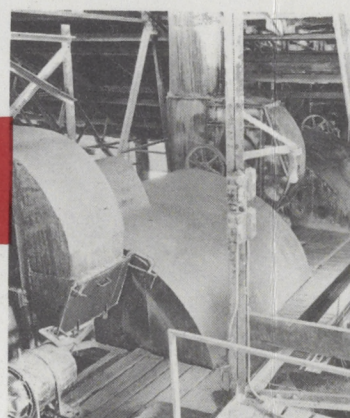




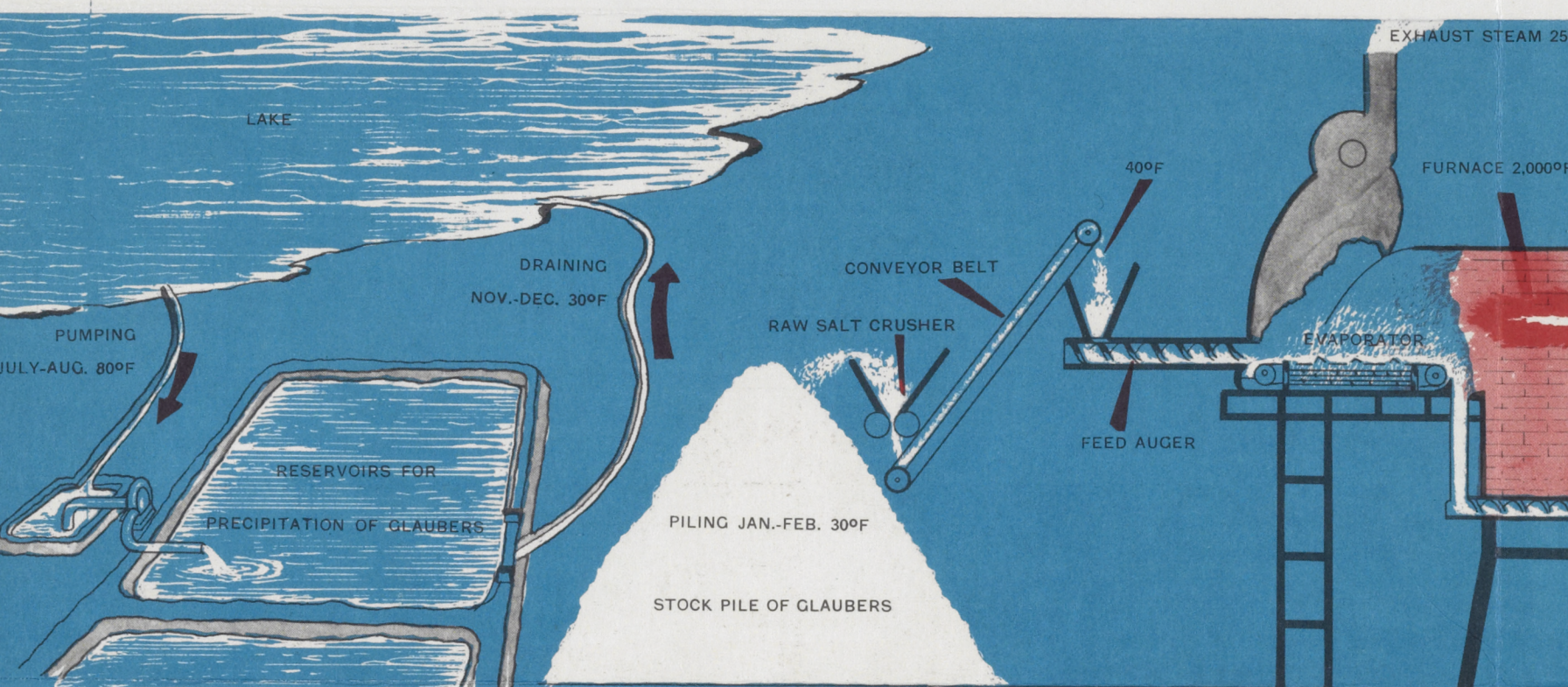
The brine is pumped into reservoirs



Dragline harvesting with stockpile of raw sodium sulphate in the background



A conveyer belt brings the raw material to the five evaporators in the background



## PROCESS

Sodium sulphate deposits are found in saucer-like depressions in areas where drainage is poor and where evaporation exceeds rainfall every year.

These conditions exist at Chaplin Lake. Its 18 square miles, with a brine depth of approximately two feet, contain 15 million tons (out of an estimated 200 million in the province) of crystalline sodium sulphate.

The newest techniques of recovery and processing are used at the Chaplin plant to assure a finished product of the highest quality.

Temperatures, both natural and artificial, are of prime importance in the production of sodium sulphate. The recovery process depends on natural changes in temperature from summer to winter to form crystals of Glauber's Salts, while processing temperatures as high as 2000 degrees F. are used to reduce these salts into a remarkably pure finished product.

### BRINING PROCESS:

The salt-saturated brine, while at its highest density during hot summer months, is carried from the lake by ditchlines and pumped into reservoirs, each covering an area seven city blocks in size.

With cool fall weather cooling the brine, raw sodium sulphate (Glauber's Salts) forms into crystals and drops to the bottom of the reservoirs.

When the temperature nears freezing, most of the salt has fallen out of solution and the remaining weak brine is then drained back into the lake. In winter the salt is 'harvested' from the reservoirs by tractor-pulled scrapers and stockpiled near the plant.

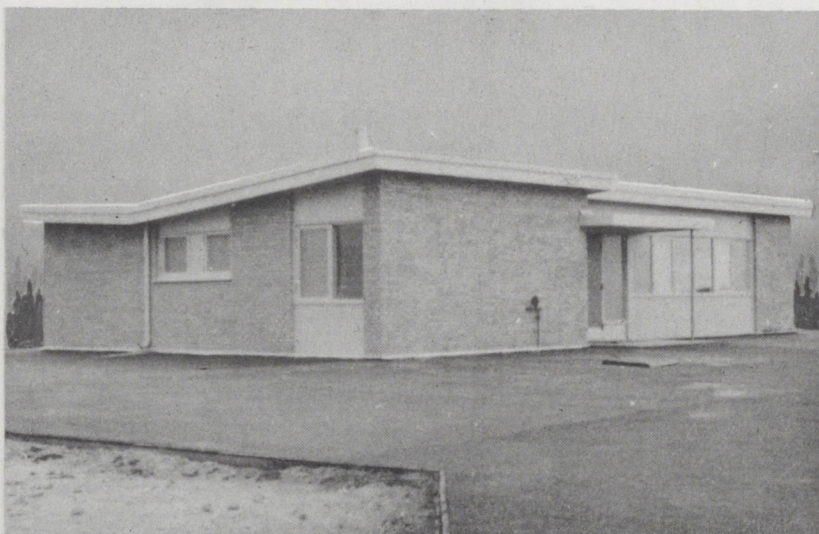
### REFINING, STORAGE AND SHIPPING:

The first stage of the drying process takes place in five evaporators where half of the water in the raw sodium sulphate is removed.

Large rotary dryers complete the process. Over 200,000 gallons of water are removed and discharged into the atmosphere daily.

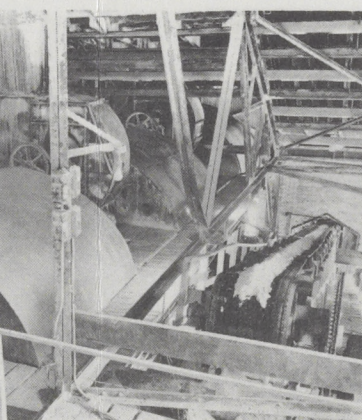
The dry salt is then crushed and screened to customer specifications. Large storage tanks, with a capacity of 13,000 tons, provide a steady source of high quality sodium sulphate.

The plant's strategic location on a double main-line track assures prompt delivery—by bag or in bulk—of all orders. Shipments are made daily.

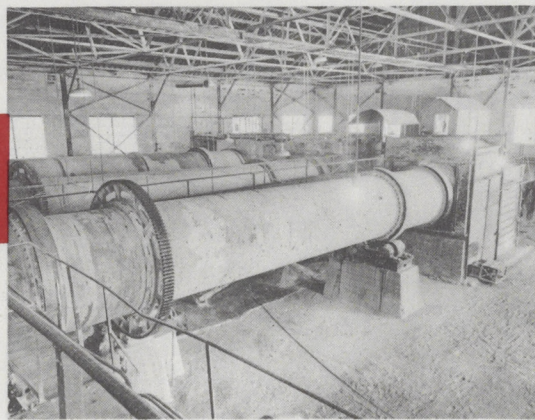


New Office Building

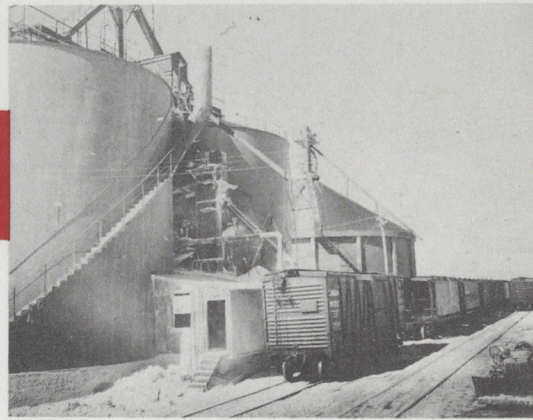




belt brings the raw salt to one evaporators in the plant.

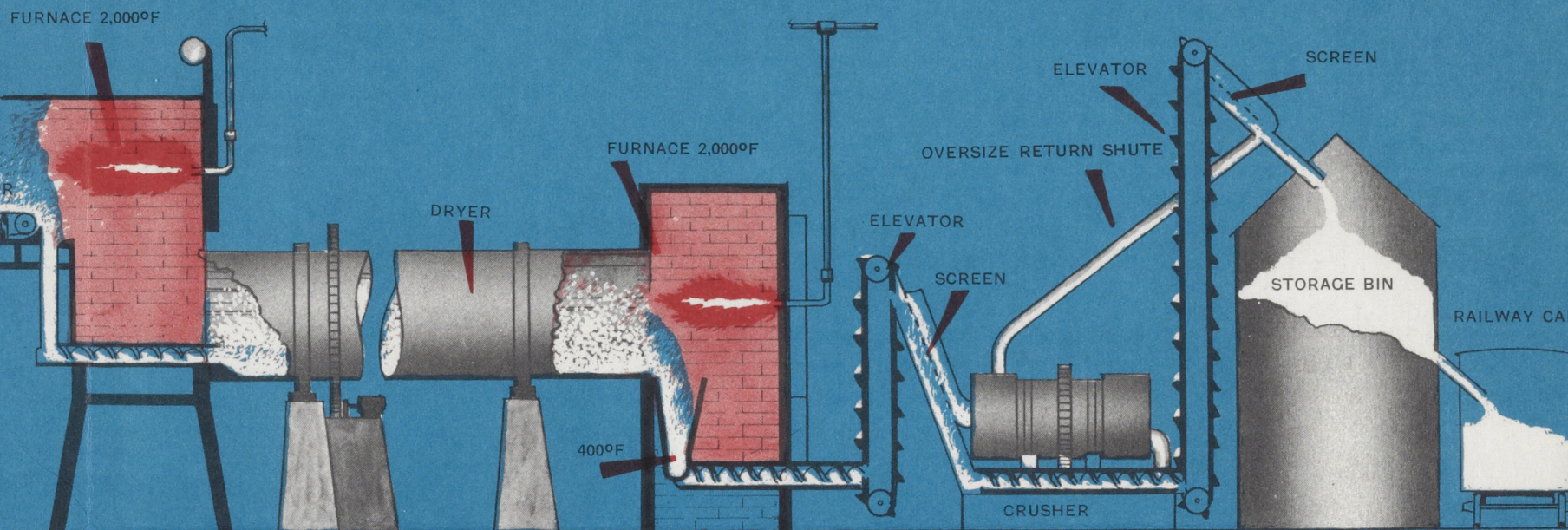


Rotary Dryers remove the remaining moisture



Storage and loading facilities at Chaplin

HAUST STEAM 250°F



## USES

### KRAFT PULP

The extraordinary demand for sodium sulphate in the expanding Kraft Pulp industry was a main factor in the establishment of the Chaplin plant. Today, this industry is still the largest consumer of sodium sulphate. Although the production cost of kraft paper is relatively high, its superior quality guarantees a ready market. Nearly all wrapping paper is made from kraft pulp and with continual improvements in bleaching methods kraft pulp is being converted into an ever widening variety of paper products.

### GLASS

Although the Glass Industry as a whole is a secondary user of sodium sulphate, there are some very large plants where consumption approaches the same level as that of the Kraft Pulp industry.

### MINERAL FEEDS

Mineral feed supplements are used extensively in the United States. In Canada and other parts of the world their use is comparatively recent. The percentage of sodium sulphate put into prepared mineral feeds varies with the manufacturer.

### OTHER USES

Synthetic Detergents, Textile Dye Baths, Heavy Chemicals, Non-Ferrous Smelting, Pharmaceuticals, Tanning of Leather, Ultramarine Blue Pigment, Fertilizers, Heating of Buildings.

